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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/624,944	07/21/2003	Jianfeng Chen	04577/000N072-US0	7694

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DARBY & DARBY P.C.
P. O. BOX 5257
NEW YORK, NY 10150-5257

EXAMINER	
WARTALOWICZ, PAUL A	

ART UNIT	PAPER NUMBER
1754	

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/624,944	CHEN ET AL.	
	Examiner	Art Unit	
	Paul A. Wartalowicz	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7 and 9-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7 and 9-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Withdrawn Rejections

The rejections under 35 USC 112 have been withdrawn in light of applicant's amendments.

Response to Arguments

Applicant's arguments filed 9/8/06 have been fully considered but they are not persuasive.

Applicant argues that the Examiner infers that this limitation is not taught by Harada and that Vita does not teach a feed solution that would contain OH^- ions and that accordingly Vita cannot be relied upon to teach or suggest "maintaining the reaction mixture at a constant OH^- concentration"..

However, the rejection at issue relies upon Harada to teach that the hydroxide ion is added to reaction (paragraphs 68 & 69). Vita is relied upon to teach that it is known to optimize the concentration of the reactants (col. 2, lines 55-60) for the purpose of controlling the crystal form and particle size of barium titanate particles.

Harada teaches an excess of alkali solution (NaOH for example, paragraph 0069), and from this teaching it would be obvious that the pH is maintained at 14 and that because an excess of hydroxides is present, for all intents and purposes, the amount of OH^- is constant.

As to the arguments drawn to the fact that Vita does not teach a feed solution containing hydroxide ions, Vita is not relied upon to teach the limitation of a reaction containing hydroxide limitations. In response to applicant's arguments against the

references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Vita is only relied upon to teach an optimization of feed solutions to obtain the desired particle size of barium titanate.

Applicant argues that only upon impermissible hindsight would a person of ordinary skill be motivated to combine Guo with references directed to preparing barium titanate and that the reaction disclosed in Guo is a gas/liquid reaction, wherein a Higee reactor is used to improve the mass transfer velocity of reactants (water glass and carbon dioxide) in order to increase reaction efficiency.

However, a reaction in a higee reactor achieves strong mixing, rapid refreshing of the interface in the Higee reactor, enlarging the contact area, and heightening conversion (col. 6, lines 5-10). The above qualities are equally beneficial to a liquid/liquid reaction as for a gas/liquid reaction. One of ordinary skill in the art would recognize to use a higee reactor to obtain better conversion, etc. in the reaction of Harada as these reaction conditions are beneficial to the reaction of Harada. There is no evidence that the higee reactor of Guo would not be capable of performing the reaction of Harada. Thus, one of ordinary skill would turn to Guo to achieve better conversion, etc. in the reaction of Harada. It would be obvious to use the higee reactor of Guo in order to provide a turbulent reaction to drive the reaction to completion.

Guo does not teach away from Harada; Guo is relied upon for the broad teaching that a higee reactor is used in a reaction so as to obtain turbulent mixing conditions, heightened conversion, and to drive the reaction to completion.

Additionally, Guo is not relied upon to teach a liquid/liquid reaction. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The rejection over Harada in view of Guo as illustrated in the Office Action does not result in the combination of the process of Harada with the process of Guo (namely one of the reactants of Guo, carbon dioxide). In response to applicant's argument that in Guo, carbon dioxide and water glass are carbonized using air at high pressure and that Harada teaches preventing a reaction between barium and carbon dioxide, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Applicant argues that Kawamoto and Kerchner do not teach or suggest maintaining the reaction mixture at a constant hydroxide concentration.

However, Kawamoto and Kerchner are not relied upon to teach or suggest maintaining the reaction mixture at a constant hydroxide concentration. In response to

applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-7, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (U.S. 2002/0090335) in view of Guo et al. (U.S. 6827916) and Vita et al. (U.S. 2985506).

Harada et al. teach a process for producing a dielectric material (paragraph 0035, lines 1-3) comprising spherical barium titanate particles wherein the Ba/Ti ratio is greater than one (paragraph 0001, lines 1-6) wherein the particles are sintered into a ceramic body (particles are barium titanate which are homogenous, paragraph 0055,

lines 1-4) wherein the barium titanate is produced by mixing titanium tetrachloride (paragraph 0068, lines 3-5) with barium chloride or barium nitrate (paragraph 0071, lines 1-4) wherein the barium chloride or barium nitrate is introduced with an aqueous alkali solution (paragraph 0071, lines 4-6) such as sodium hydroxide, potassium hydroxide or ammonia water (paragraph 0069, lines 1-3) and the afore reactants mixed to produce a reaction solution is aged at a temperature of 40 to 100°C (aging is equivalent to preheating, paragraph 0076, lines 3-7) and then subjecting the reaction solution to hydrothermal treatment at a temperature of from 100 to 350°C (paragraph 0079, lines 1-4) wherein the particles obtained are filtered (paragraph 0112, lines 14-15) then washed with water and dried (paragraph 0080, lines 1-3).

Harada et al. teach that the aqueous alkali solution is added in an amount of 1.5 moles based on one mole of titanium used (Entire Document, particularly paragraph 0070) and from this teaching it would be obvious that the pH is maintained at 14 and that because an excess of hydroxides is present, for all intents and purposes, the amount of OH^- is constant.

As to the limitations wherein the concentration of metal ions (Ba^{2+} + Ti^{4+}) ranges from 0.1 to 2.0 mol/L and wherein the base concentration in the solution (II) ranges from 3 to 15 mol/L and wherein the flow rates of the solutions range from 5 to 300L/h and the flow rate ratios of the solutions range from 0.5 to 10, Vita teaches a process for producing barium titanate particles (col. 1, lines 18-20) wherein the rate of flow and concentration of the solution is varied for the purpose of controlling the crystal form and particle size of the barium titanate crystals (col. 2, lines 55-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to vary the rate of flow and concentration of the solution, since it has been held that discovering an optimum value or a result effective variable involved only routine skill in the art. In re Boesch, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980). The artisan would have been motivated to vary the rate of flow and concentration of the solution by the reasoned explanation that varying the rate of flow and the concentration in order to control the crystal form and particle size of the barium titanate crystals (col. 2, lines 55-60) as taught by Vita.

From this disclosure, it would be obvious to optimize the flow rates of the reactants, including the alkali solution (hydroxide ions), of Harada et al.

As to the limitation wherein the reaction takes place in a high-gravity reactor, Guo et al. teach a process for producing a fine powder (col. 1, lines 11-14) wherein reactions take place in a high-gravity reactor such that the centrifugal acceleration is 20-40000 m/s^2 (20-40000 m/s^2 is within the range of 1.25G to 12500 G, col. 4, lines 10-13) for the purpose driving the reaction to completion (col. 6, lines 5-10).

Therefore, it would have been obvious to one of ordinary skill in the art to provide wherein reactions take place in a high-gravity reactor such that the centrifugal acceleration is 20-40000 m/s^2 (20-40000 m/s^2 is within the range of 1.25G to 12500 G, col. 4, lines 10-13) in Harada et al. in order to drive the reaction to completion (col. 6, lines 5-10) as taught by Guo et al.

As to the limitation wherein the ceramic exhibits uniform microstuctures, uniform particle size, homogenous chemical compositions, small grain sizes, and a dielectric

constant of up to 2500, Harada et al. teach the afore mentioned process for producing barium titanate wherein the process meets the limitations of the claimed process such that the barium titanate of Harada et al. has the same properties of the claimed invention such as wherein the ceramic exhibits uniform microstuctures, uniform particle size, homogenous chemical compositions, small grain sizes, and a dielectric constant of up to 2500 and inherently teaches the afore mentioned properties.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (U.S. 2002/0090335) in view of Guo et al. (U.S. 6827916) and Vita et al. (U.S. 2985506) and Kawamoto et al. (U.S. 2003/0022784).

Harada et al. teach a process for producing barium titanate as described in claim 1. Harada et al. fail to teach the limitation wherein the Ba/Ti molar ratio is from 1.2 to 2.0.

Kawamoto et al., however, teach a process for producing barium titanate (paragraph 0003, lines 1-3) wherein the Ba/Ti molar ratio is 1.16 (paragraph 0022, lines 1-5) for the purpose of producing the desired stoichiometry of barium and titanium (paragraph 0016, lines 10-13).

The prior art range is so close that one skilled in the art would have expected it to have the same properties. *Titanium Metals Corp. v. Banner,* 227 USPQ 773.

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to modify the Ba/Ti molar ratio (paragraph 0022,

lines 1-5) in Harada et al. in order to produce the desired stoichiometry of barium and titanium (paragraph 0016, lines 10-13) as taught by Kawamoto et al.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harada et al. (U.S. 2002/0090335) in view of Guo et al. (U.S. 6827916) and Vita et al. (U.S. 2985506) and Kerchner (U.S. 6129903).

Harada et al. teach a process for producing barium titanate powders as described in claim 1. Harada et al. fail to teach wherein the pH value of the reaction mixture is maintained constant at about 14.

Kerchner, however, teach a process for producing barium titanate powders (col. 1, lines 13-15) wherein the addition of the barium source increases the pH of the reaction mixture to about 13 (col. 5, lines 22-25) for the purpose of promoting the reaction (col. 5, lines 23-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time applicant's invention was made to provide wherein the addition of the barium source increases the pH of the reaction mixture to about 13 (col. 5, lines 22-25) in Harada et al. in order to promote the reaction (col. 5, lines 23-25) as taught by Kerchner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Wartalowicz whose telephone number is (571) 272-5957. The examiner can normally be reached on 8:30-6 M-Th and 8:30-5 on Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Paul Wartalowicz
November 22, 2006

STUART L. HENDRICKSON
PRIMARY EXAMINER